Multiples of Bytes

KB -> Kilobyte

MB -> Megabyte

GB -> Gigabyte

TB -> Terabyte

1 KB = 2^{10} B = 1024 B

1 MB = 2^{10} KB = 2^{20} B

1 GB = 2^{10} MB = 2^{20} KB = 2^{30} B

1 TB = 2^{10} GB = 2^{20} MB = 2^{30} KB = 2^{40} B

RAM and ROM size

If a memory size is 512B then

i) how many locations are in memory chip?
i) How many address bits are there?
i)

512 locations

Since $512 = 2^9$, address bits = 9

Since 1B = 8 bits, data bits = 8

If a memory size is 64KB then

i) how many locations are in memory chip?
i) How many address bits are there?
i)

Since $64KB = 2^6 \times 2^{10}$ B = 2^{16} locations

address bits = 16

Since 1B = 8 bits, data bits = 8

RAM and ROM size contd.

If a memory size is 4 MB then

i) how many locations are in memory chip? Since 4MB = $2^2 \times 2^{20}$ B = 2^{22} locations

i) How many address bits are there? address bits = 22

i) Since 1B = 8 bits, data bits = 8

If a memory size is 256 M × 16 then

i) how many locations are in memory chip? Since 256M = $2^8 \times 2^{20}$ = 2^{28} locations

i) How many address bits are there? address bits = 28

i) data bits = 16

RAM and ROM size contd.

If a memory size is 32GB then

i) how many locations are in memory chip? Since 32GB = $2^5 \times 2^{30}$ B = 2^{35} locations

i) How many address bits are there? address bits = 35

i) Since 1B = 8 bits, data bits = 8

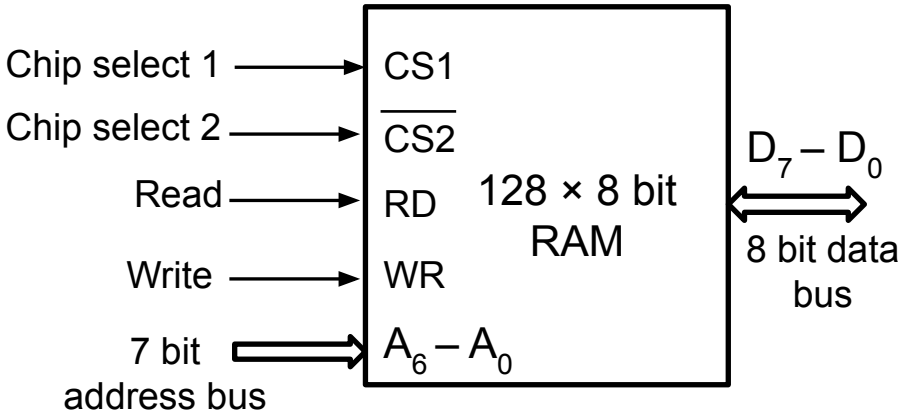
If a memory size is 2 T × 16 then

i) how many locations are in memory chip? Since 2 T = $2^1 \times 2^{40} = 2^{41}$ locations

i) How many address bits are there? address bits = 41

i) data bits = 16

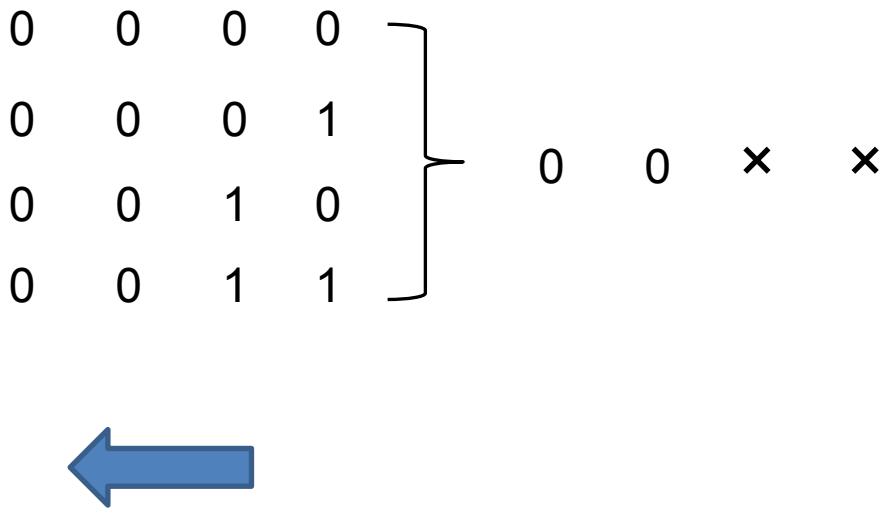
Block diagram of RAM chip

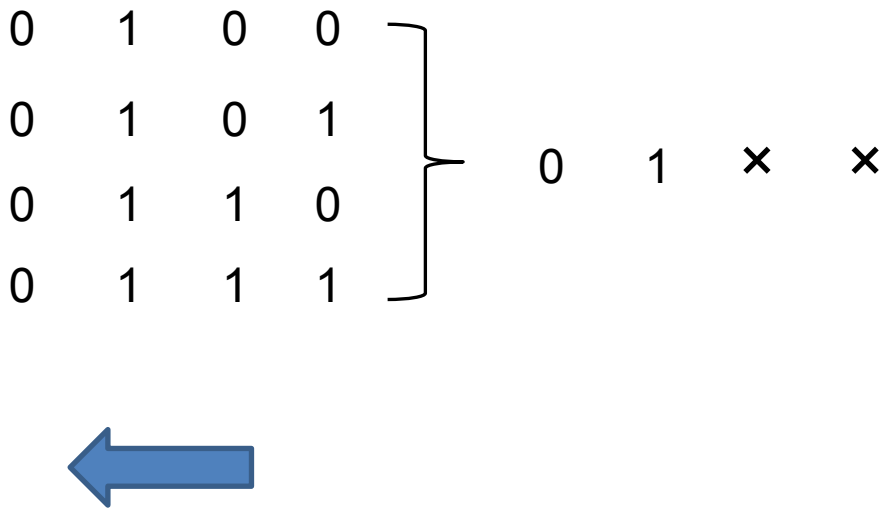


Function table

CS1	$\overline{CS2}$	RD	WR	Memory function	State of Data bus
0	0	×	×	Inhibit	High Impedance
0	1	×	×	Inhibit	High Impedance
1	0	0	0	Inhibit	High Impedance
1	0	0	1	Write	Input data to RAM
1	0	1	×	Read	Output data from RAM
1	1	×	×	Inhibit	High Impedance

Thank You


0 0 0 0
0 0 0 1
0 0 1 0
0 0 1 1
0 0 × ×


0 1 0 0
0 1 0 1
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